






## Power Optimizer M500

### Instruction manual

Scope of delivery	1x M500 	1x Instruction manual 	Required accessories	1x Flange nut 	1x M8 screw 	 Service: +49 7243 924 1486
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#### – Safety instructions for end users -

- Never carry out independent work on the M500 or open the housing for any reason.
- Do not allow unauthorized persons to enter the vicinity of the PV system or the Power Optimizer.
- Please keep the instruction manual for reference during all activities related to the product.

#### – Safety instructions for electricians –

- All work associated with the product may only be carried out by qualified electricians. The electrician must comply with national and regional regulations.
- Please read and follow all instructions carefully before installation. If there are any uncertainties or detailed information is required, please read the extended user instructions or call our service telephone.
- Electrical work may only be carried out in compliance with the 5 safety rules of electrical engineering.
- To avoid burns, the electrician should wait a few minutes after switching off the system until the optimizers have cooled down sufficiently when dismantling or replacing the M500.
- Install the M500 at a sufficient distance from the roof or other surfaces to ensure adequate heat dissipation.
- Only install intact M500 with a complete scope of delivery.
- Do not make any modifications to the M500.
- In particular, establish a solid electrical connection between the M500 and the modules and/or the PV string.

#### – General notes –

- The M500 may only be operated as intended and following the specified technical data.
- The reverse current flow of the Power Optimizer is excluded from the intended use.
- **During commissioning, maintenance, or repair of the PV system, no short circuits should be performed on the module string or the Power Optimizer, as this can lead to damage to the Power Optimizer.**
- **The M500 must not be connected within a parallel circuit.**
- Please observe all instructions provided by BRC Solar GmbH in the instruction manual and the warnings on the M500. The warnings on the M500 must always be legible and not be removed, changed, or manipulated.
- Applicable local laws, regulations, directives, and standards must be observed as a priority for operation and during installation, uninstallation, and maintenance. The safety instructions in the instruction manual are incomplete and only serve as a supplement.

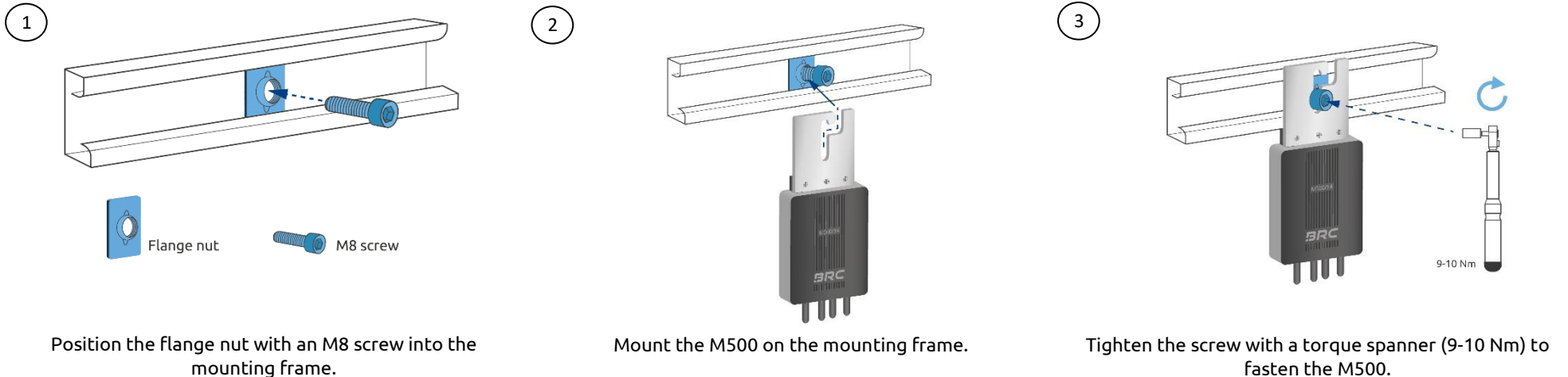
## Power Optimizer M500

### – How it works –

- Since the modules in PV systems are connected in series, the output - i.e., the energy yield of a system - depends on the current strength of the weakest module. If shade falls on the part of a photovoltaic system, the entire system's output is severely weakened. Even a single partially shaded module is enough to reduce the output of all the others.
- Modern inverters can circumvent this problem by activating the bypass diodes of the modules. When the bypass diode is activated, the maximum possible current (the short-circuit current) flows through the shaded cell string. The difference to the string current flows through the bypass diode and the affected cell string produces no power.
- Since a short-circuit current still flows through the shaded cell string, the most heavily shaded cell heats up. As a result, there is a risk of a hot spot. Depending on the duration and intensity it occurs, this hot spot can damage or, in the worst case, destroy the module. Likewise, the bypass diodes can be overloaded and destroyed if frequently activated.
- The M500 is a DC/DC converter connected in parallel to the module via plug-and-play and requires no configuration or adjustment.
- In the event of shading, it is automatically activated by the inverter, similar to the bypass diode. When activated, the Power Optimizer reduces the output voltage and increases the output current to correspond to the string current. Thus, the BRC Power Optimizer can continue to supply the available module power to the PV system.

### – M500 installation –

#### Step 1: Fastening the M500 to the PV module support



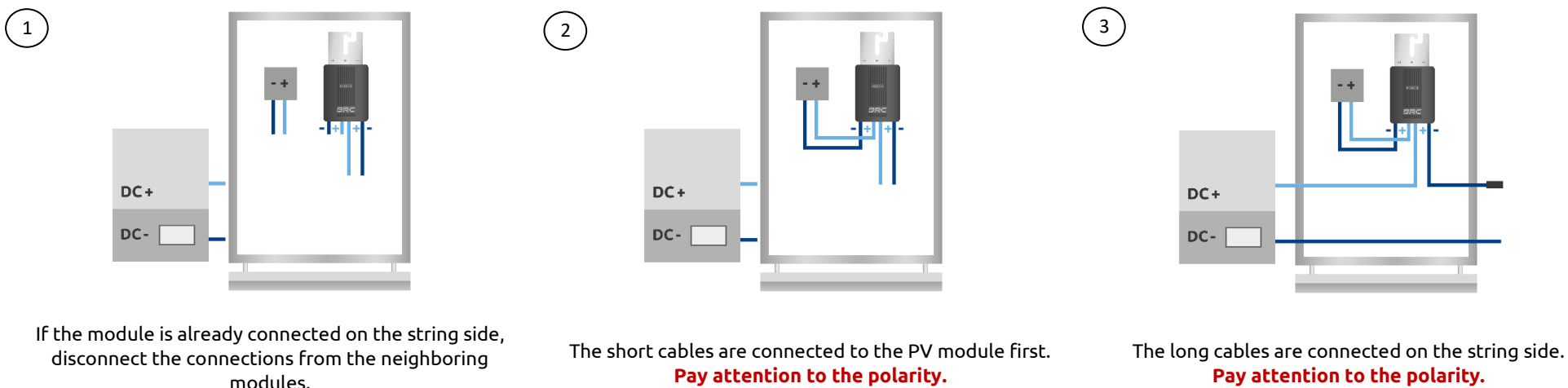
## Power Optimizer M500

Step 2: Protective measures against electrical shock

Follow the safety instructions on page 1 and the 5 safety rules for electrical work.  
Before connecting the M500 to the string, check for no string current.

Step 3: M500 electrical connection

**NOTE:** The M500 has standard Stäubli MC4 connectors. These must not be connected to other types of connectors.



Step 4: Checking the mounting

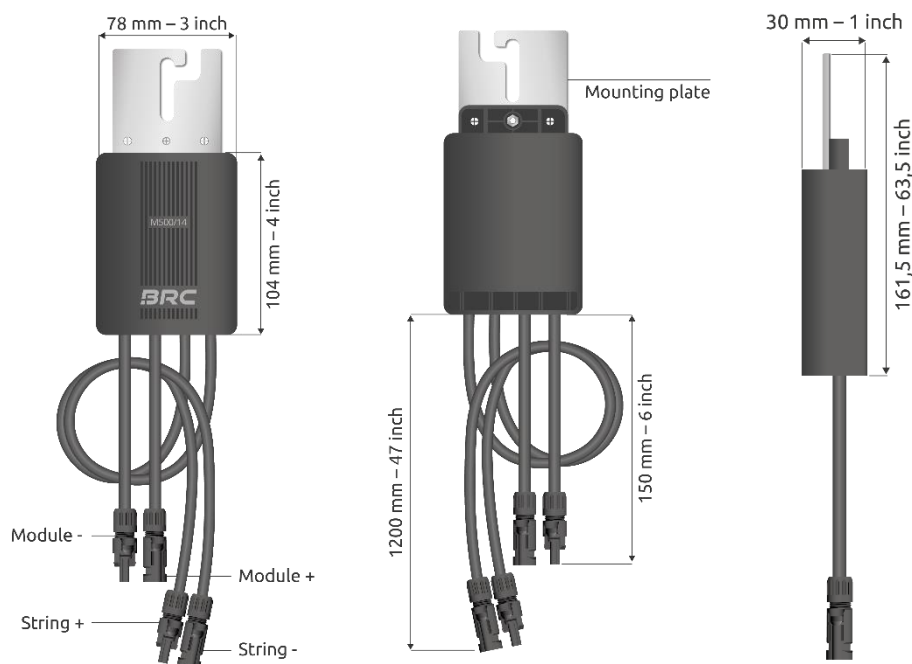
After installation, check the fastening of the M500 to the mounting frame and the correct electrical connection of the plugs.

Step 5: Startup by switching on the inverter

After completing all the installation work, put the PV system into operation.

## Power Optimizer M500

### – M500 structure –



### – Disposal instructions –

- The transport packaging can be recycled under local waste disposal.
- After use, the M500 and all associated components must be disposed of as electronic waste following the local laws in force.

### – Product conformity –

BRC Solar GmbH, located at Gehrstraße 7 in D-76275 Ettlingen, Germany, declares that the product M500/14 complies with the basic requirements of the national directives when the installation instructions are observed and the product is used as intended. A complete declaration of conformity can be found on the website of BRC Solar GmbH.

### – Extended user instructions –

- For more detailed information on the installation, uninstallation, and use of the M500, please refer to the extended user instructions. Scan the QR code or visit our website at ([www.brc-solar.de/en/downloads-en/](http://www.brc-solar.de/en/downloads-en/)) to go to the extended user instructions.

